

Ser. No. 10/712,112

2

10010484-2

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Original) A fluid ejection device comprising:
 - an internal power supply path;
 - a power regulator providing an offset voltage from the internal power supply path voltage, the power regulator including a self-calibration circuit adapted to determine a regulation band of the power regulator defined by a lower set point offset voltage and an upper set point offset voltage;
 - a group of nozzles;
 - a corresponding group of firing resistors; and
 - a corresponding group of switches controllable to couple a selected firing resistor of the group of firing resistors between the internal power supply path and the offset voltage to thereby permit electrical current to pass through the selected firing resistor to cause a corresponding selected nozzle to fire.

2. (Original) The fluid ejection device of Claim 1 wherein the power regulator includes:
 - a digital-to-analog converter (DAC) coupled to the internal power supply path and configured to receive a digital offset command representing a desired offset voltage and to provide an analog offset voltage from the internal power supply path voltage.

3. (Previously Presented) The fluid ejection device of Claim 1 further comprising:

Ser. No. 10/712,112

3

10010484-2

wherein the power regulator further includes a feedback amplifier having a first input coupled to an input offset voltage, a second input coupled to a feedback line, and an output coupled to a drive line;

wherein a selected switch corresponding to a selected firing resistor has a control gate controlled by the drive line;

wherein the selected firing resistor of the group of firing resistors includes a first terminal and a second terminal coupled to the feedback line, wherein the drive line provides the offset voltage to the feedback line and the second terminal of the selected firing resistor through the selected switch.

4. (Previously Presented) A fluid ejection device comprising:

an internal power supply path;

a power regulator providing an offset voltage from the internal power supply path voltage, the power regulator including a self-calibration circuit adapted to determine a regulation band of the power regulator defined by a lower set point offset voltage and an upper set point offset voltage;

a group of nozzles;

a corresponding group of firing resistors; and

a corresponding group of switches controllable to couple a selected firing resistor of the group of firing resistors between the internal power supply path and the offset voltage to thereby permit electrical current to pass through the selected firing resistor to cause a corresponding selected nozzle to fire;

wherein the power regulator further includes a feedback amplifier having a first input coupled to an input offset voltage, a second input coupled to a feedback line, and an output coupled to a drive line;

wherein a selected switch corresponding to a selected firing resistor has a control gate controlled by the drive line;

wherein the selected firing resistor of the group of firing resistors includes a first terminal and a second terminal coupled to the feedback line, wherein the drive line provides the offset voltage to the feedback line and the second terminal of the selected firing resistor through the selected switch;

Ser. No. 10/712,112

4

10010484-2

wherein the self-calibrating circuit includes:

a regulation detector configured to compare the input offset voltage at the first input of the feedback amplifier and the offset voltage on the feedback line and provide an in regulation signal which is activated based on the power regulator being in regulation.

5. (Original) The fluid ejection device of Claim 3 further comprising:
 - an internal power ground;
 - wherein the first terminal of the selected firing resistor is coupled to the internal power supply path; and
 - wherein the selected switch is coupled between the second terminal of the firing resistor and the internal power ground.

6. (Previously Presented) A fluid ejection device comprising:
 - an internal power supply path;
 - a power regulator providing an offset voltage from the internal power supply path voltage, the power regulator including a self-calibration circuit adapted to determine a regulation band of the power regulator defined by a lower set point offset voltage and an upper set point offset voltage;
 - a group of nozzles;
 - a corresponding group of firing resistors; and
 - a corresponding group of switches controllable to couple a selected firing resistor of the group of firing resistors between the internal power supply path and the offset voltage to thereby permit electrical current to pass through the selected firing resistor to cause a corresponding selected nozzle to fire;
 - wherein the power regulator further includes a feedback amplifier having a first input coupled to an input offset voltage, a second input coupled to a feedback line, and an output coupled to a drive line;
 - wherein a selected switch corresponding to a selected firing resistor has a control gate controlled by the drive line;

Ser. No. 10/712,112

5

10010484-2

wherein the selected firing resistor of the group of firing resistors includes a first terminal and a second terminal coupled to the feedback line, wherein the drive line provides the offset voltage to the feedback line and the second terminal of the selected firing resistor through the selected switch;

wherein the selected switch is coupled between the internal power supply path and the first terminal of the selected firing resistor.

7. (Original) The fluid ejection device of Claim 2 wherein the self-calibration circuit includes:

a set point DAC up/down counter storing a set point offset voltage digital value which is provided as the digital offset command.

8-15. (Cancelled)

16. (Original) A fluid ejection assembly comprising:

at least one fluid ejection device, each fluid ejection device including:
an internal power supply path;

a power regulator providing an offset voltage from the internal power supply path voltage, the power regulator including a self-calibration circuit adapted to determine a regulation band of the power regulator defined by a lower set point offset voltage and an upper set point offset voltage;

a group of nozzles;

a corresponding group of firing resistors; and

a corresponding group of switches controllable to couple a selected firing resistor of the group of firing resistors between the internal power supply path and the offset voltage to thereby permit electrical current to pass through the selected firing resistor to cause a corresponding selected nozzle to fire.

17. (Original) The fluid ejection assembly of Claim 16 wherein the at least one fluid ejection device includes multiple fluid ejection devices.

Ser. No. 10/712,112

6

10010484-2

18. (Original) A method of self-calibrating power delivery control to firing resistors in an fluid ejection device comprising:

coupling a selected firing resistor of a group of firing resistors between an internal power supply path and an offset voltage from the internal power supply path voltage to cause electrical current to pass through the selected firing resistor to cause a corresponding selected nozzle to fire; and

determining a power regulation band defined by a lower set point offset voltage and an upper set point offset voltage.

19. (Original) The method of Claim 18 wherein determining the power regulation band further comprises:

providing an in regulation signal which is activated based on being in the power regulation band.

20. (Original) The method of Claim 18 wherein providing the offset voltage includes:

providing a digital offset command representing a desired offset voltage;

and

converting the digital offset command to an analog offset voltage from the internal power supply path voltage.

21. (Original) The method of Claim 20 wherein determining the power regulation band further comprises:

storing a set point offset voltage digital value; and

providing the set point offset voltage digital value as the digital offset command.

22, 23. (Cancelled)

24. (Original) A self-calibrating power regulator in an fluid ejection device comprising:

Ser. No. 10/712,112

7

10010484-2

a power delivery control loop providing an offset voltage from an internal power supply path voltage, wherein a selected firing resistor in the fluid ejection device is coupled between the internal power supply path and the offset voltage to cause electrical current to pass through the selected firing resistor to cause a corresponding selected nozzle to fire; and

a self-calibration circuit adapted to determine a regulation band of the power regulator defined by a lower set point offset voltage and an upper set point offset voltage.

25. (Cancelled)